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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/683,329	12/14/2001	Robert C.U. Yu	D/A0A96Q	8628

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EXAMINER

HARAN, JOHN T

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 06/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/683,329

Applicant(s)

YU ET AL.

Examiner

John T. Haran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 May 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the amendment filed on 5/13/04. All previous rejections of the claims under 35 USC 112, first and second paragraph, are withdrawn in light of the amendments to the claims and in view of Applicant's arguments.

Drawings

2. The corrected drawings of Figures 1-4 were received on 5/13/04. These drawings are approved.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schlueter et al (U.S. Patent 5,549,193) in view of Yu (U.S. Patent 5,688,355), Schlueter et al (U.S. Patent 5,997,974), and Schlueter et al (U.S. Patent 5,942,301).

Schlueter '193 is directed to a method of making a seamed belt that minimizes the thickness differential between the seamed portion of the belt and adjacent portions of the belt wherein the ends of the belt are shaped with laser to form joints that overlap, butt, and interlock; i.e. puzzle cut with rabbet tongues (Column 4, lines 46-57; Figures 1-4). While Schlueter '193 is directed to minimize the thickness differential, there appears to still be a noticeable thickness differential (See Figures 2-4).

Yu is also directed to a method of making a seamed belt using laser ablation that eliminates the excessive thickness of the seam overlap region present in the prior art wherein the ends of the support sheet are laser ablated to have complementary shapes, are overlapped and bonded together (Column 3, lines 16-19; Column 7, line 63 to Column 8, line 22). This process results in a seamed belt have substantially no added seam thickness (See Figures 6b, 7b, 8b, and 9b). One skilled in the art would have readily appreciated that both Schlueter '193 and Yu teach the disadvantages of having a thickness differential in the seam area and would have been motivated to laser ablate the ends of the sheet in Schlueter '193 so that when joined there is substantially no thickness added to the seam as taught in Yu. It would have been obvious to one of ordinary skill in the art at the time the invention was made to laser ablate the ends of the sheet so that when they are overlapped, butted, and interlocked there is substantially no added seam thickness in the method of Schlueter '193 as suggested in Yu in order to overcome the disadvantages of having a thickness differential between the seam and adjacent areas.

Schlueter '193 is silent towards using a template when forming the puzzle cut with a laser, however such is well known and conventional as shown for example in Schlueter '301. Schlueter '301 teaches forming complementary puzzle cuts to ends of a sheet to be mated together with laser and teaches using a template to control the pattern (Column 3, lines 39-46 and Examples Table 1). While Schlueter '301 is silent towards whether or not the template prevents laser from striking the sheet under the template, one skilled in the art would have readily recognized using such a template in

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order to avoid removing material that is not supposed to be removed or damaging material. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use first and second templates for defining the puzzle cut pattern to be laser ablated in the two ends of the sheet which prevent the laser from removing material under the template in the method Schlueter '193 as is well known and conventional in the art as suggested in Schlueter '301.

Schlueter '193 is also silent towards applying coatings over the seamed belt to make a "seamless" electrostatographic belt. It is well known and conventional to have electrostatographic belts and that there are numerous methods for doing such. One method is taught in Schlueter '974 which teaches making an invisible seam ("seamless") electrostatographic belt wherein the two ends of a support sheet are provided with mating puzzle cut patterns by laser ablating, are seamed together, and then the support sheet has a series of coatings applied to provide a smooth and "seamless" electrostatographic belt (Column 4, lines 24-26; Column 6, lines 61-64; Column 12, lines 42-44; Figure 10; Column 14, lines 55-67). One skilled in the art would have readily appreciated that the method of Schlueter '974 has the advantage of making a seamless electrostatographic belt with a smooth and seamless surface. One skilled in the art would have readily appreciated coating the seamed belt of Schlueter '193 with a series of coatings as taught in Schlueter '974 in order to form a "seamless" electrostatographic belt. It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply a series of coatings to the seamed belt of Schlueter '193

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as suggested in Schlueter '974 in order to provide a smooth and "seamless" electrostatographic belt.

In summation, it would have been obvious to one of ordinary skill in the art at the time the invention was made to laser ablate the ends of the sheet so that when they are overlapped, butted, and interlocked there is substantially no added seam thickness in the method of Schlueter '193 as suggested in Yu in order to overcome the disadvantages of having a thickness differential between the seam and adjacent areas; to use first and second templates for defining the puzzle cut pattern to be laser ablated in the two ends of the sheet which prevent the laser from removing material under the template in the method Schlueter '193 as is well known and conventional in the art as suggested in Schlueter '301; and to apply a series of coatings to the seamed belt of Schlueter '193 as suggested in Schlueter '974 in order to provide a smooth and "seamless" electrostatographic belt.

Regarding claim 2, Yu teaches passing the laser through a mask (Column 17, lines 51-60).

Regarding claims 3-4, laser beams are electromagnetic radiation and particle beams.

Regarding claim 5, one skilled in the art would have readily appreciated that the laser beam can't reach the entire end portion to form all the features at once and that there necessarily needs to be relative motion between the laser and the sheet.

Regarding claim 6, Schlueter '974 teaches one of the layers applied to form an electrostatographic belt is a photoconductive layer (Column 12, lines 42-55).

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Regarding claims 7 and 8, Schlueter '193 teaches it is conventional to use ultrasonic welding or adhesive to bond the ends together (Column 1, lines 55-58) and it would have been obvious to use such conventional means.

Regarding claim 9, Schlueter '301 teaches the templates are shaped in a puzzle cut pattern.

Regarding claim 11, the laser beam illumination process described in the claim is well known and conventional, as shown for example in Yu (See Figure 5) and it would have been obvious to use such conventional illumination means.

Regarding claim 12, Schlueter '301 teaches the templates are shaped in a puzzle cut pattern and Schlueter '193 teaches it is conventional to use ultrasonic welding to bond the ends together (Column 1, lines 55-58) and it would have been obvious to use such conventional means.

Regarding claim 13, Schlueter '193 teaches it is conventional to use adhesive to bond the ends together (Column 1, lines 55-58) and it would have been obvious to use such conventional means.

Regarding claims 14-15 Schlueter '193 teaches a rabbeted joint (See Figures).

Regarding claim 17, one skilled in the art would have readily appreciated that the opposite surface of the opposite end would need to be shaped in order to have a rabbeted joint.

Regarding claim 18, Schlueter '974 teaches one of the layers applied to form an electrostatographic belt is a photoconductive layer (Column 12, lines 42-55).

Regarding claim 19, the support sheet of Schlueter '193 is a single layer of substantially homogeneous material.

Regarding claim 20, one skilled in the art would have readily appreciated that PET fits the parameters described for the flexible substrate sheet in Schlueter '193 (Column 4, lines 25-46).

Regarding claim 21, Schlueter '193 is silent towards using a mask, moving one of the laser and the sheet relative to the other, and applying a photoconductive layer. Yu teaches passing the laser through a mask (Column 17, lines 51-60). One skilled in the art would have readily appreciated that the laser beam can't reach the entire end portion to form all the features at once and that there necessarily needs to be relative motion between the laser and the sheet. Schlueter '974 teaches one of the layers applied to form an electrostatographic belt is a photoconductive layer (Column 12, lines 42-55). It would have been obvious to use a mask, move one of the laser and the sheet relative to the other, and apply a photoconductive layer in the method of Schlueter '193, as modified above.

Regarding claims 22 and 23, Schlueter '193 teaches it is conventional to use ultrasonic welding or adhesive to bond the ends together (Column 1, lines 55-58) and it would have been obvious to use such conventional means.

Response to Arguments

5. Applicant's arguments filed 5/13/04 have been fully considered but they are not persuasive.

Applicant argues that Schlueter '193, Yu, and Schlueter '301 do not teach applying a coating layer after seaming a belt and then argues that Schlueter '974 provides no motivation to a coating layer to the seamed belt of Yu. It appears that Applicant has misconstrued the rejection. Nowhere in the rejection was the belt of Yu modified with the teachings of Schlueter '974.

Schlueter '193 is the primary reference and teaches laser ablating the ends of a belt to desired shapes for overlapping, interlocking, and mating the two ends to form a seamed belt that minimizes the thickness differential between the seamed portion of the belt. However as noted in the Figures there appears to still be a thickness differential.

Yu is relied upon for the teaching of substantially eliminating a thickness differential at a seam by precisely laser ablating the ends of a belt to complementary shapes and then forming a seamed belt with substantially no added seam thickness. The fact that Yu has layers coated on the support sheet that make the belt electrostatographic is irrelevant. It would be obvious to rely on the teaching of Yu to form a seamed belt with substantially no added seam thickness by laser ablating the ends of the sheet to form precisely complementary shapes in the method of Schlueter '193.

Schlueter '193 is directed to making an endless seamed belt and is silent towards the belt having any additional layers, such as ones present in an electrostatographic belt. However, it is well known and conventional to have electrostatographic belts and to first laser ablate the ends of a support sheet, seam them together and then coat the various layers over the seamed support sheet to form a

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seamless electrostatographic belt, as shown in Schlueter '974. It would have been obvious to make the seamed belt of Schlueter '193, made using the teachings of Yu, electrostatographic by applying the necessary layers after seaming the belt as suggested in Schlueter '974.

Additionally, when deciding the best manner for choosing how to make the belt electrostatographic, one skilled in the art would have readily appreciated that the method of Schlueter '974 results in a smooth, seamless surface, whereas making the belt electrostatographic using the method of Yu (applying layers and then seaming) would not.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **John T. Haran** whose telephone number is **(571) 272-1217**. The examiner can normally be reached on M-Th (8 - 5) and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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